United States Department of the Interior

Fish and Wildlife Service

Ecological Services
Montana Field Office
585 Shephard Way, Suite 1
Helena, Montana 59601-6287

In Reply refer to:
File:M19 Bitterroot National Forest
06E11000-2019-F-0543 Bitterroot Forest Plan - Grizzly bears

July 1, 2019

Matthew Anderson, Forest Supervisor
Bitterroot National Forest
1801 North First Street
Hamilton, Montana 59840

Dear Mr. Anderson:

The U.S. Fish and Wildlife Service (Service) has reviewed your May 7, 2019 biological assessment regarding the effects of the continued implementation of the Bitterroot National Forest Plan (Forest Plan) on the Bitterroot National Forest (Forest). The biological assessment analyzed the effects of the Forest Plan on the federally listed grizzly bear (*Ursus arctos horribilis*). The Forest made a determination of may affect, likely to adversely affect for grizzly bears. Additional information was received through June 19, 2019.

The attached biological opinion addresses the effects of the Forest Plan on the listed grizzly bear and is based on information provided for this action in the biological assessment prepared by Nancy Warren, Wildlife Biologist (contractor). The biological opinion was prepared in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). A complete project file of this consultation is on file at the Service's Montana Field Office.

Thank you for your continued assistance in the conservation of endangered, threatened, and proposed species. If you have questions or comments related to this consultation, please contact Katrina Dixon at (406) 449-5225.

Sincerely,

Jodi L. Bush
Office Supervisor

enclosure

cc: AES, R-6, MS 60120

File: 7759 Biological Opinions - 2019

ENDANGERED SPECIES ACT SECTION 7 CONSULTATION

BIOLOGICAL OPINION

on the

Effects of continued implementation of the Bitterroot National Forest Plan on Grizzly Bears

Agency:	U.S. Department of Agriculture Forest Service Bitterroot National Forest Hamilton, Montana
Consultation Conducted by:	U.S. Fish and Wildlife Service Montana Field Office Helena, Montana
Date Issued:	July 1, 2019

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I. INTRODUCTION

This biological opinion was prepared by the U.S. Fish and Wildlife Service (Service) and analyzes the effects of the continued implementation of the Bitterroot National Forest Plan (Forest Plan) on the Bitterroot National Forest (Forest) on grizzly bears (*Ursus arctos horribilis*). Formal consultation was initiated on May 13, 2019; the date the Service received the biological assessment (U.S. Forest Service 2019). We continued to receive information regarding the Forest Plan through June 19, 2019.

Section 7(b)(3)(A) of the Endangered Species Act of 1973, as amended (Act) requires that the Secretary of Interior issue biological opinions on federal agency actions that may adversely affect listed species or critical habitat. Biological opinions determine if the action proposed by the action agency is likely to jeopardize the continued existence of listed species or destroy or adversely modify critical habitat. Section 7(b)(3)(A) of the Act also requires the Secretary to suggest reasonable and prudent alternatives to any action that is found likely to result in jeopardy or adverse modification of critical habitat, if any has been designated. If the Secretary determines no jeopardy, then regulations implementing the Act further require the Director to specify reasonable and prudent measures and terms and conditions necessary or appropriate to minimize the impact of any incidental take resulting from the action(s). This biological opinion addresses only impacts to federally listed species and does not address the overall environmental acceptability of the proposed action.

Consultation History

In the fall of 2017, the Service determined that grizzly bears may be present on the portion of the Forest east of Highway 93 and added them to the Forest's list of species that may be present. Based on that information, informal consultation began between the Forest and the Service on the effects of the Forest Plan on grizzly bears. On March 15, 2019, the Forest submitted a letter to the Service requesting re-initiation of consultation on the Forest Plan in order to address impacts to grizzly bears given the change of status to 'may be present' on that portion of the Forest. Further consultation continued through email, meetings, and phone conversations with Forest staff and contractors. On May 13, 2019, we received a final biological assessment (dated May 7, 2019) and request for consultation on the effects of the Forest Plan on grizzly bears (U.S. Forest Service 2019).

The biological assessment (U.S. Forest Service 2019), information in our files, as well as additional information and discussions throughout the informal and formal consultation process were used in the preparation of this biological opinion. A complete project file of this consultation is on file at our office.

II. DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the continued implementation of the 1987 Forest Plan. The Forest Plan is the principle long-range guidance document for the Forest, providing direction for project and activity decision making. The Forest Plan provides an integrated plan for land and resource management, articulates goals and objectives, provides the kinds of uses that are suitable for areas of a national forest, management standards and guidelines that apply to different kinds of

activities, and the designation of special areas like Research Natural Areas. For information on Forest Plan direction that may assist in the management of grizzly bears, refer to Appendix 2 of the biological assessment (U.S. Forest Service 2019). While the Forest Plan applies to the entire Forest, this consultation and analyses only address the area of the Forest where bears may be present, which includes those areas of the Forest that occur east of Highway 93. The Forest Plan is considered a framework programmatic action. It does not authorize, fund, or carry out an action but provides direction for future actions that may be authorized, funded, or carried out by the Forest. Therefore, any action subsequently authorized, funded, or carried out under the Forest Plan, will be addressed in subsequent section 7 consultations, as appropriate. If a proposed project is not consistent with the Forest Plan, the project cannot proceed as proposed unless the plan is amended so that the project is consistent with the plan. Activities subsequently authorized, funded, or carried out under the Forest Plan that may affect grizzly bears are described in detail in the biological assessment, which is hereby incorporated by reference (U.S. Forest Service 2019). The Forest estimates that the life of the current Forest Plan is approximately 10 more years.

III. STATUS OF THE SPECIES /CRITICAL HABITAT DESCRIPTION

No critical habitat has been designated for grizzly bears. For information on the status of grizzly bears, including species description, life history, and status and distribution, refer to the Grizzly Bear Recovery Plan (U.S. Fish and Wildlife Service 1993), the Grizzly Bear 5-Year Review (U.S. Fish and Wildlife Service 2011), the grizzly bear recovery program 2018 annual report (U.S. Fish and Wildlife Service 2019), the NCDE Grizzly Bear conservation strategy (U.S. Fish and Wildlife Service et al. 2013), Grizzly bear demographics in the NCDE (Costello et al. 2016), NCDE grizzly bear population monitoring team annual report 2018 (Costello and Roberts 2019), the Greater Yellowstone Ecosystem conservation strategy (U.S. Fish and Wildlife Service 2016), the Yellowstone Grizzly Bear Investigations 2017 (van Manen et al. 2018), the Cabinet-Yaak Grizzly Bear Recovery Area 2017 Research and Monitoring Progress Report (Kasworm et al. 2018a), Density, distribution, and genetic structure of grizzly bears in the Cabinet-Yaak Ecosystem (Kendall et al. 2016), and the Selkirk Mountains Grizzly Bear Recovery Area 2017 Research and Monitoring Progress Report (Kasworm et al. 2018b). These documents (referenced here), include the best available science regarding the status and distribution of grizzly bears and are incorporated by reference.

Analysis of the Species/Critical Habitat Likely to be Affected

The biological assessment determined that the Forest Plan would likely adversely affect individual grizzly bears. Therefore, formal consultation with the Service was initiated and this biological opinion has been written to determine whether or not activities associated with this action are likely to jeopardize the continued existence of grizzly bears. Grizzly bears are listed as threatened under the Act. Critical habitat has not been designated for this species, therefore none would be affected by the proposed action.

IV. ENVIRONMENTAL BASELINE

Under the provisions of section 7(a)(2), when considering the "effects of the action" on listed species, the Service is required to consider the environmental baseline. Regulations implementing the Act (50 C.F.R. § 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed federal projects in the action area that have undergone section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.
The action area for the analysis of effects of the Forest Plan includes the portion of the Forest that occurs east of Highway 93. The action area lies completely outside of the grizzly bear recovery zones. The action area includes a total of 456,622 acres of Forest lands managed by the Stevensville and Darby/Sula Ranger Districts. Approximately 44 percent of the action area is within wilderness, wilderness study area, and inventoried roadless areas. The remaining 56 percent occurs outside of such designations. For analysis purposes, the action area has been further divided into five smaller areas by grouping watersheds. These analysis areas encompass an area approximately the size of an annual home range of an adult female grizzly bear. The areas do not represent actual home ranges, nor do they represent management units for grizzly bears. They simply provide a method for analyzing effects to grizzly bears consistently across the action area. Grizzly bears have not necessarily been verified in each of these analysis areas nor is it implied that occupancy is expected or required. The five analysis areas have been named the following: Eightmile-Burnt Fork- Big Birch-Willow Creek; Skalkaho Creek; Sleeping Child-Rye Creek; Lower East Fork; and Upper East Fork.

Status of the Species within the Action Area

This section focuses on the status of grizzly bears occurring within the action area. Recent information indicates only a few verified grizzly bear observations in the northwest portion of the Bitterroot Valley and in the Sapphire Mountains (U.S. Forest Service 2019). The biological assessment describes three specific occurrences (*Ibid*.). While the gender is not known for these verified occurrences, it likely that they are males. During the summer of 2018, Defenders of Wildlife maintain about six carnivore monitoring stations near the Sapphire Divide around the head of Willow Creek. Remote cameras did not detect grizzly bears. While a few grizzly bears have been verified in the action area, actual bear use of the action area is not well known. The verified occurrences have occurred infrequently and not across all portions of the action area, however as grizzly bear populations in both the YGBE and the NCDE continue to expand their range, albeit slowly in some areas, we expect that additional grizzly bears may inhabit more portions of the action area over the life of the Forest Plan.

The number of grizzly bears using the action area is very low and numbers will increase relatively slowly over time. This is especially true for female grizzly bears. As described in Proctor et al. (2012), males move more frequently and over longer distances than females; Males have large home ranges and establish home ranges nearly three times further away from their mother's home ranges than do female offspring. Females usually establish smaller home ranges than males that overlap with their mother's home range (Waser and Jones 1983; Schwartz et al. 2003). In doing so, they generally disperse over much shorter distances than male grizzly bears (McLellan and Hovey 2001; Proctor et al. 2004). Therefore, female dispersal is a multi-generational process where females must live year-round in an area, successfully reproduce, and

offspring disperse into adjacent, unoccupied habitat. Thus, female grizzly bear presence in the action area is likely to increase slowly over time.

Factors Affecting Species Environment within the Action Area

This section identifies and describes key areas of Forest management that affect the grizzly bears' environment. These factors include access management, attractant management and developed sites, livestock management, vegetation management, fire management, and oil and gas leasing. General impacts of these factors will be discussed in more detail in the '*Effects of the Action'* section below.

Access Management

Motorized access has long been recognized as a major factor affecting grizzly bears (see section below, '*General Effects of Roads on Grizzly Bears'*). Some portions of the action area are highly roaded, with the Lower East Fork and Sleeping Child-Rye Creek analysis areas having the highest existing linear route density (2.5 and 2.2 miles per square mile, respectively). Providing the linear route density gives an idea of the amount of roads in the action area, however it does not represent how these routes occur on the landscape. For example, portions of the analysis areas may have high route densities (even within the analysis areas with lower linear route densities) while other portions of the analysis areas may have low route densities or even no motorized routes (even within the analysis areas with higher linear route densities). Table 1 displays the existing linear motorized route density within the five analysis areas of the action area.

Table 1. Existing open linear motorized route density on Forest Lands within the action area (U.S. Forest Service 2019).

Analysis Area	Total Amount of Forest Land (Square Miles)[1]	Motorized Roads and Trails on Forest Land (miles)	Linear Route Density of Forest Routes[2]
Eightmile-Burnt Fork-Big Birch-Willow Creek	118	174	1.5
Skalkaho Creek	101	140.6	1.4
Sleeping Child-Rye Creek	133	290	2.2
Lower East Fork	100	253.3	2.5
Upper East Fork	163	195.6	1.2

[1] includes only Forest land within analysis area and does not include other land ownerships.
[2] does not include routes on other land ownerships; rounded to nearest tenth.

Winter motorized use occurs in the action area outside of designated roadless areas. The Forest Plan does not limit over-snow vehicle use specifically in the late spring period, but the travel plan is designed to increase large quiet areas that are free from disturbance by over-snow vehicles (U.S. Forest Service 2019).

Food and Attractant Storage and Site Development

The Forest Plan does not contain direction regarding the management of bear attractants. On Forest lands, requirements for proper storage of food, garbage, or other attractants are established and enforced through issuance of a special order(s), rather than through the Forest Plan. At this time, the only food storage order in effect within the action area is for the Anaconda-Pintler wilderness area. To date, no known instances of food conditioning and/or conflicts with grizzly bears related to food and attractant storage have occurred in the action area. Instances of food conditioning and conflicts with black bears are known to have occurred in the Bitterroot valley. As such, the potential does exist for issues with grizzly bears related to food and attractants.

Developed recreation sites are sites or facilities with features that are intended to accommodate public use and recreation, such as campgrounds, rental cabins, fire lookouts, summer homes, and visitor centers. Within the action area, the Forest has 19 sites that provide for overnight stays, for recreational or administrative use. Recreation use sites include five campgrounds (Black Bear, Gold Creek, Jennings Camp, Martin Creek, and Spring Gulch) and three lookouts that are used as cabin rentals. The Spring Gulch campground has garbage service and is outfitted with bear-resistant trash containers. All of the other campgrounds and the cabin rental sites are pack it in/pack it out, with no garbage service. Administrative sites include four residences, three bunkhouses, and four lookouts that are staffed during the fire season. The residences and bunkhouses are located on Ranger District compounds. No conflicts between grizzly bears and humans have occurred related to these sites. None of these sites are known to have chronic problems or conflicts with black bears.

Livestock Grazing

The Forest has 16 cattle grazing allotments within the action area, covering 163,044 acres or 36 percent of the action area. No domestic sheep allotments occur within the action area. Horses and mules may be permitted for use on Forest lands, primarily in support of outfitter and guide operations of Forest administrative use in wilderness areas. No apiaries occur on the Forest. No documented grizzly bear depredations on livestock have occurred within the action area.

Vegetation Management

Suitable timber is defined as those acres that are classified as available for timber production and are specifically managed for growth yield. The Forest Plan identified 216,672 acres as suitable for timber production within the action area (about 47 percent of the Forest). Forest Plan monitoring data show that actual timber harvest levels have been well below the projections made in 1987. The emphasis of the timber harvest program has been on treatment of hazardous fuels, particularly in the wildland-urban interface, and salvage of bark beetle-killed trees.

Fire Management

Wildfire has a strong influence on the age distribution and spatial arrangement of forest vegetation. Although substantial variation occurs year-to-year, from 1996 to 2016 a total of 240,870 acres burned by wildfires across the action area (approximately 53 percent of the action area). Wildfire control efforts and use of prescribed burning occur within the action area. The acres available and locations where such methods are used vary across the action area.

The use of wildland fire for resource benefit may also be used as a management tool across the action area. The Forest considers using wildland fire for resource benefit in most areas of the Sapphires; the term 'wildland fire' is inclusive of both wildfire and prescribed fire. The management strategy on any particular fire depends on the time of year, fuel conditions, short-term and long-term weather forecasts, the line officer's comfort level with not actively suppressing the fire, and conversations with adjacent National Forests if the fire is likely to move across boundaries. While the Forest typically suppresses wildfires, instances where wildfires would be allowed to burn within the action area may occur. The Forest is actively pursuing larger-scale prescribed fire actions that are aligned with wildland fire for resource benefit within the action area.

Energy and Mineral Development

Currently no gas or oil development occurs on the Forest. While numerous mining claims occur on the Forest, many have been abandoned. A recent query of Bureau of Land Management records show three currently active mining claims within the action area. However, no active mining operations are ongoing at this time. Minor activities, such as surveying and collecting samples on a claim are allowed at any time. No construction of roads, building cabins, or caching of food or equipment are authorized and before an active operation could begin, the claimant would have to file a notice of intent and a plan of operations with the Forest. No notices of intent or plans of operations have been filed at this time. Reclamation has been completed for the Stansbury Holdings vermiculite mine.

The Forest receives numerous requests for riprap material, sand, gravel, and decorative, landscaping stone. Common use and community pit designations are an effective way of meeting this need while insuring that management plans are developed and reclamation funds are available. Four pit/collecting areas are open to the public within the action area: Ambrose, Upper Burnt Fork, Railroad, and Springer Gulch. An additional gravel pit, Jim Hell, is used by the Forest for administrative use. Miscellaneous roadside borrow areas may also be used to provide rock for administrative use.

Climate Change

In the 5-year status review, the Service examined climate change and potential effects on grizzly bears (U.S. Fish and Wildlife Service 2011). The most likely ways in which climate change may potentially affect grizzly bears are a reduction in snowpack levels, shifts in the denning season, shifts in the abundance and distribution of some natural food sources, and changes in fire regimes due to summer drought. The potential positive and negative effects would likely be variable and are difficult to predict. Grizzly bears are habitat generalists and opportunistic omnivores, which may make them less susceptible to changes in plant communities than some other wildlife species.

V. EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, with the effects of other activities interrelated or

interdependent with that action. Indirect effects are those caused by the proposed action and are later in time, but still are reasonably certain to occur (50 C.F.R. § 402.02). The effects of the action are added to the environmental baseline to determine the future baseline and to form the basis for the determination in this opinion. Should the federal action result in a jeopardy situation and/or adverse modification conclusion, the Service may propose reasonable and prudent alternatives that the federal agency can take to avoid violation of section 7(a)(2). The effects discussed below are the result of direct and indirect impacts of implementing the proposed action.

Motorized Access

General Effects of Motorized Access on Grizzly Bears

This section provides a general discussion of direct and indirect effects of motorized access management on grizzly bears as affected by road densities. Research has confirmed adverse impacts of roads on grizzly bears (Mace et al. 1996, Mace et al. 1999, Proctor et al. 2018). Negative impacts associated with roads and excessive road densities influence grizzly bear population and habitat use patterns. The Grizzly Bear Compendium (IGBC 1987) summarized impacts reported in the literature including:

- Avoidance/displacement of grizzly bears away from roads and road activity;
- Habitat loss, modification, and fragmentation due to roads and road construction, including vegetative and topographic disturbances;
- Changes in grizzly bear behavior, especially habituation to humans, due to ongoing contact with roads and human activities conducted along roads; and
- Direct mortality from road kills, legal and illegal harvest, and other factors resulting from increased human-bear encounters.

The Interagency Grizzly Bear Committee (IGBC) Taskforce provided standardized definitions for roads and standardized methods to measure road densities and define analysis areas within the recovery zones as a result of grizzly bear research information on open and total road densities and grizzly bear core areas (IGBC 1998). The Service considers the management of roads in the recovery zones one of the most important factors in grizzly bear habitat conservation and the IGBC Taskforce guidelines as the best direction with which to manage roads within the recovery zones.

Displacement and security. Some grizzly bears, particularly subadults, readily habituate to humans and consequently suffer increased mortality risk. However, many grizzly bears under-use or avoid otherwise preferred habitats that are frequented by people. Not all avoidance results in significant impacts to grizzly bears. However, if road densities reach a level that such under-use of preferred habitat represents modification of normal grizzly bear behavior, grizzly bears may experience significant impacts. Negative association with roads arises from the grizzly bears' response to vehicles, vehicle noise and other human-related noise around roads, human scent along roads, and hunting and shooting along or from roads. Grizzly bears that experience such negative consequences learn to avoid the disturbance and annoyance generated by roads.

Some may not change this resultant avoidance behavior for long periods after road closures. Even occasional human-related vehicle noise can result in annoying grizzly bears to the extent that they continue to avoid roaded habitat.

All factors contributing to direct links between roads and displacement from habitat have not been quantified. The level of road-use by people is likely an important factor in assessing the potential displacement caused by any road. Contemporary research, however, indicates that grizzly bears consistently were displaced from roads and habitat surrounding roads, often despite relatively low levels of human use (Mattson et al. 1987, McLellan and Shackleton 1988, Aune and Kasworm 1989, Kasworm and Manley 1990, Mace and Manley 1993, Mace et al.1996).

Avoidance behavior is often strongest in adult grizzly bears, with males selecting for high quality habitats and absence of humans (Gibeau et al. 2002). Males that were found using high quality habitat near roads, did so during the night where hiding cover was available (ibid). However, adult females were more likely to avoid humans all together, rather than seek out the highest quality habitats. Mueller et al. (2004) reported all age and sex classes used habitats closer to high-use roads and development during the human inactive period. All bears showed a considerably greater avoidance of high-use roads and development during periods of high human activity. They did show however, that regardless of the time of day, subadult bears were found closer to high-use roads than adult bears. Gibeau et al. (2002) also demonstrated that subadults were almost always closer to human activity than adults. Boulanger and Stenhouse (2014) found that subadult grizzly bears were most vulnerable to road-based mortality.

In Montana, Aune and Stivers (1982) reported that grizzly bears avoided roads and adjacent corridors even when the area contained preferred habitat for breeding, feeding, shelter and reproduction. McLellan and Shackleton (1988) found that grizzly bears used areas near roads less than expected in southeastern British Columbia and estimated that 8.7 percent of the total area was rendered incompatible for grizzly bear use because of roads. In Montana, Mace and Manley (1993) reported use of habitat by all sex and age classes of grizzly bears was less than expected in habitats where total road densities exceeded two miles per square mile. Twenty-two percent of the South Fork Study area exceeded two miles per square mile. Adult grizzly bears used habitats less than expected when open motorized access density exceeded one mile per square mile. Further, female grizzly bears in the South Fork Study area tended to use habitat more than 0.5 mile from roads or trails greater than expected. As traffic levels on roads increased, grizzly bear use of adjacent habitat decreased (Mace et al. 1996). In Yellowstone, Mattson et al. (1992) reported wary grizzly bears avoided areas within 2 kilometers (1.2 miles) of major roads and 4 kilometers (2.4 miles) of major developments or town sites.

Mace et al. (1996) and other researchers have used 500 meters as the zone of influence around roads. Waller and Servheen (2005) also demonstrated avoidance of areas within 500 meters of US-2. Benn and Herrero (2002) set zones of influence of 500 meters and 200 meters around roads and trails, respectively. They reported that all 95 human-caused grizzly bear mortalities with known locations that occurred in Banff and Yoho National Parks between 1971 and 1998 occurred within these zones of influence along roads and trails or around human settlements. Gibeau and Stevens (2005) documented bears further from roads when distant from high quality habitat, indicating avoidance behavior.

Research suggests that grizzly bears benefit from road closures aimed at minimizing traffic on roads within important seasonal habitat, especially in low elevation habitats during the spring (Mace et al. 1999). When roads are located in important habitats such as riparian zones, snowchutes and shrub fields, habitat loss through avoidance behavior can be significant. Mace et al. (1996) found that most of the roads within grizzly bear seasonal ranges were either closed to vehicles or used infrequently by humans. Some grizzly bears avoided areas with a high total road density even when the roads were closed to public travel. If human-related disturbances such as high levels of road use continue in preferred habitats for extended periods of time, grizzly bear use of the area may be significantly limited, particularly use by female grizzly bears. In the Swan Mountain study (Mace et al. 1996), female grizzly bear home range selection of unroaded cover types was greatest and as road densities increased, selection declined. Zager (1980) reported the underuse of areas near roads by females with cubs. Aune and Kasworm (1989) and McLellan (1989) found that female cubs generally established their home range within or overlapping with their mother's home range, whereas males generally dispersed from their mother's home range. Long-term displacement of a female from a portion of her home range may result in long-term under-use of that area by female grizzly bears because cubs have limited potential to learn to use the area. In this way, learned avoidance behavior could persist for more than one generation of grizzly bears before grizzly bears again utilize habitat associated with closed roads. Thus, displacement from preferred habitats may significantly modify normal grizzly bear behavioral patterns.

Conversely, grizzly bears can become conditioned to human activity and show a high level of tolerance especially if the location and nature of human use are predictable and do not result in overtly negative impacts for grizzly bears (Mattson 1993). In Glacier National Park, Jope (1985) suggested grizzly bears in parks habituate to high human use and showed less displacement, even in open habitats. Yonge (2001) found that grizzly bears near Cooke City, Montana, were willing to consistently forage in very close proximity to high levels of human use if cover was sufficient and energetically efficient feeding opportunities were present. Both Mattson (1993) and Yonge (2001) postulated that areas with higher levels of human activity might have a positive effect for bears by serving as a kind of refugia for weaker population cohorts (subadults and females with cubs) seeking to avoid intra-specific competition (adult males). However, Mattson qualified this observation by adding that the beneficial effects vary as to whether hunting is allowed, and how closely the human population is regulated. Further, food conditioned grizzly bears were much more likely to be killed by humans.

Both Yonge (2001) and Mattson (1993) indicated that increases in human use levels can be deleterious if some human activities are unregulated, such as use of firearms, presence of attractants, nature and duration of human uses. Conversely, a level of coexistence between humans and grizzly bears can be achieved if such activities are controlled. Near Cooke City, Montana, the New World Mine reclamation project had minimal effects on grizzly bears, in part because reclamation activities were temporally and spatially predictable and people associated with the work were carefully regulated against carrying firearms or having attractants available to grizzly bears (Tyers, unpublished 2006). In the Swan Valley of Montana, raw location data from a small number of collared grizzly bears show nocturnal use of highly roaded habitat (C. Servheen, USFWS, pers. comm. 2005). The Swan Valley data have not been statistically analyzed and the study was not designed to determine the impact of roads on bears, sample size is very small, and perhaps most importantly, mortality rates for these grizzly bears are not yet

known. However, these data indicate that some grizzly bears can apparently habituate to relatively high levels of human activity.

Specific causes or factors involved in the selection or preferences for certain home ranges by grizzly bears are not well understood. Mace and Manley (1993) found that grizzly bear home ranges in the South Fork Study area included remote areas in high elevations. South Fork Study grizzly bear habitat-use data, road density analyses of the South Fork Study area, previous studies and CEM analysis (U.S. Forest Service 1994, Mace et al. 1999) suggested that low-elevation habitats were not freely available to grizzly bears because of high road densities and associated human use in these areas. High road densities in low-elevation habitats may result in avoidance of or displacement from important spring seasonal habitat for some grizzly bears or high mortality risk for those individuals that venture into and attempt to exploit resources contained in these low-elevation areas.

Male grizzly bears typically have larger home ranges than females, and males, subadults, and transient grizzly bears are more mobile and do not have the same energetic needs as adult females. Transient individuals are highly mobile and not restricted to finding food and shelter within a home range. Thus, while displacement from habitat along roads may affect behavioral patterns such as feeding or sheltering of all grizzly bears, we do not anticipate such effects would cause harm or significant impairment to these behavioral patterns of transient, subadult, or male grizzly bears. Where road densities are high enough to result in significant displacement, significant impairment to behavioral patterns of adult female grizzly bears may occur.

Core/secure areas. The Service considers significant declines in expected use of habitat by grizzly bears a serious consequence of high road densities. Significant declines in grizzly bear use of habitat areas key to the survival of the grizzly where seasonal or year-long activity, under natural, free-ranging conditions is common, especially those habitat components with high seasonal values, indicate that habitat needed for survival and recovery is less available. Ideal grizzly bear habitat provides some areas isolated from excessive levels of human impact. Because grizzly bears can conflict with humans and their land uses, grizzly bear populations require a level of safety from direct human-caused mortality and competitive use of habitat such as settlement, roading, recreation, excessive logging, mining and livestock grazing.

Analysis in the South Fork Study area (Mace and Manley 1993, Mace et al. 1996) indicated the importance of unroaded habitat, especially for females with cubs. Mace and Manley (1993) reported adult females used habitat further than 0.5 mile from roads or trails more than expected; 21 percent of the composite home range had no trails or roads and 46 percent was unroaded (greater than 0.5 mile from a road). Substantive blocks of unroaded habitat were components of all adult female home ranges. Of the adult female locations within unroaded polygons, 83 percent occurred within 7 polygons that exceeded 2,260 acres in size. Based on grizzly bear habitat use data from the Yellowstone ecosystem, secure habitat and road densities outside of secure habitat were important predictors of grizzly bear survival (Schwartz et al. 2010).

The IGBC Taskforce (IGBC 1994, 1998) recognized the importance of secure areas to grizzly bears. The Taskforce defined "core areas" as those areas with no motorized use of roads and trails (during the non-denning period) or high intensity, non-motorized use, providing some level of secure habitat for grizzly bears. Motorized use, such as snowmobiling or that associated with timber harvest, could occur within core areas during the denning (winter) period. The Taskforce

recommended the establishment of core areas in all subunits. Core areas should be a minimum of 0.31 miles from any open road or motorized trail, with the size and connectivity of core area patches being established at the recovery area level, depending on ecosystem-specific habitat conditions. Once established and effective, core areas should remain intact on the landscape for at least 10 years (*Ibid*.). In the South Fork Study area of the NCDE, approximately 68 percent of the adult female composite home range was core area (U.S. Forest Service in litt. 1994, K. Ake, U.S. Forest Service, pers. comm. 2005).

Habituation to Human Attractants. Continued exposure to human presence, activity, noise, and other elements can result in habituation, which is essentially the loss of a grizzly bear's natural wariness of humans. High road densities and associated increases in human access into grizzly bear habitat can lead to the habituation of grizzly bears to humans. Habituation in turn increase the potential for conflicts between people and grizzly bears. Habituated grizzly bears often obtain human food or garbage and become involved in nuisance bear incidences, and/or threaten human life or property. Such grizzly bears generally experience high mortality rates as they are eventually destroyed or removed from the population through management actions. Habituated grizzly bears are also more vulnerable to illegal killing because of their increased exposure to people. In the Yellowstone region, humans killed habituated grizzly bears over three times as often as non-habituated grizzly bears (Mattson et al. 1992).

Subadult grizzly bears are more often vulnerable to habituation and illegal killing or they conflict with people and are removed through management action. Subadult grizzly bears frequently traverse long distances or unknown territory, increasing the likelihood of encountering roads, human residences or other developments where human food or other attractants are available, increasing the potential for habituation and/or conflicts with people. In the Yellowstone ecosystem, roads impacted individual age and sex classes of grizzly bears differently. Subadults and females with young were most often located near roads, perhaps displaced into roaded, marginal habitat by dominant grizzly bears (Mattson et al. 1987, Mattson et al. 1992).

Grizzly bears face direct mortality risks on public land relatively infrequently in the NCDE. Management action due to human food habituation does occur. However, on Forest Service administered lands, grizzly bear mortalities more often resulted from mistaken identity during legal hunting season, illegal or malicious killing, or automobile and train collisions (K. Ake 2011 *in litt.*).

Ake et al. (1998) summarized human-caused grizzly bear mortality locations for the period 1984 to 1996. An estimate of the amount of time grizzly bears spent in rural, roaded, and backcountry area (Mace and Waller 1998) was then compared with mortality locations. Although grizzly bears spent less than 5 percent of their time in rural settings, 56 percent of human-caused grizzly bear mortality occurred in rural roaded areas. Grizzly bear mortality data collected since 1998 support the premise of increased risk to grizzly bears in rural roaded areas. In the NCDE, mortalities associated with roaded rural (mostly private) areas exceeded the sum of mortalities from Forest Service roaded areas and areas away from roads.

Grizzly Bear Mortality. While grizzly bears are killed by vehicle collision, the most direct form of road-related mortality, the specific relationship between roads and the mortality risk to grizzly bears is difficult to quantify. The level of human use of roads is one of several factors influencing the mortality risk associated with any road. Research supports the premise that

forest roads facilitate human access into grizzly bear habitat, which directly or indirectly increases the risk of mortality to grizzly bears (Mace et al. 1987, Mattson et al. 1992, McLellan and Shackleton 1988, Dood et al. 1986).

The presence of roads alone does not necessarily result in direct mortality of grizzly bears, but the proximity of the roads to human population centers, resulting in high numbers of people using roads, and dispersed recreation in habitat around roads can pose considerable risks to grizzly bears. Social values and attitudes also contribute to the level of mortality risk to grizzly bears. Incidental or accidental human-caused grizzly bear mortality, combined with a few individuals intent on illegally shooting grizzly bears, can collectively result in serious, detrimental effects to grizzly bear populations. Access management can be instrumental to reducing mortality risk to grizzly bears by managing the present and anticipated future road use-levels resulting from the increasing human population in western Montana.

Available information regarding the effects of snowmobiles on grizzly bears is generally anecdotal, such as grizzly bear responses to various stimuli other than snowmobiles collected during research. Such reports typically lack information related to the timing of disturbance, type of den, winter conditions or other important factors necessary to assess the significance of disturbance to grizzly bears, if any. Some information collected on black bears or other ursids may have some relevance, but even the data on these species is incidental and largely theoretical.

In the fall of 2000, the science and resource management staff of the Biological Resources Management Division of the National Park Service and the Rocky Mountains Cooperative Ecosystem Studies Unit at the University of Montana organized an expert workshop to summarize the state-of-science on monitoring the effects of snowmobiles on wildlife in national parks and surrounding lands. Graves and Reams (2001) edited the output of this expert workshop for protocols to monitor snowmobile effects on wildlife. The group concluded that the evidence was inadequate to predict impacts on grizzly bears, but the *possible* effects were identified: den abandonment, loss of young, increased energetic costs while bears were in dens or displaced away from suitable habitat if outside dens, death, and learned displacement from suitable habitat resulting from exposure to disturbance (Graves and Reams 2001). Impacts to emergent bears were identified as a higher concern than impacts to denning bears.

Typical high-use snowmobile areas and potential den sites have a limited likelihood of substantive overlap. Grizzly bears generally den in either timbered habitat or very steep slopes, including the slopes of open basins. Most of the heavy snowmobile use occurs on trails, roads, or open basins, and meadows – although some snowmobile riders use steep open basins for "high marking", in which case there is a potential direct overlap between denning habitat and steep open slopes favored for "high marking" by snowmobiles. However, most denning habitat - except for "high-marking" areas - is less favorable for snowmobile use and as such there is a reduced chance of adverse overlap between grizzly bear den sites and snowmobile traffic.

Snow is an excellent sound barrier (Blix and Lentfer 1992) and impacts to denning bears would likely be less in deep snow conditions than in shallow snow conditions. It is likely that hibernating bears exposed to meaningless noise, with no negative consequences to the bear, habituate to this type of disturbance (Knight and Gutzweiler 1995). Reynolds et al. (1986) found that some bears, on occasion, appear to respond to noise or disturbance near the den site by waking up and moving around the den. On rare occasions, bears may abandon a den due to some

disturbance (Reynolds et al. 1976, Swenson et al. 1997). However, research has never documented den abandonment attributed to snowmobiles.

The noise and human activity related to snowmobile use would likely impact grizzly bears most during the early and late denning period, or when snow levels are low and the snowmobile activity is near the den site. However, the early and late denning periods are times when snow conditions would be least conducive to snowmobile activity. If disturbance occurred early during the denning season, a bear would likely have other denning habitat available. Grizzly bears are unlikely to abandon their dens very late into the winter due to the high energetic and fitness costs of doing so (Linnell et al. 2000). Theoretically, as the costs of abandoning a den and re-locating to another den increase, grizzly bears should be expected to tolerate greater levels of activity without abandonment.

Disturbance from snowmobiles is likely most consequential shortly before or after den emergence of a female with cubs. Most emerging bears move immediately to a known, reliable spring food source, such as a big game winter range (Reinhart and Tyers 1999). Females with cubs have high energetic needs, and cubs have limited mobility for several weeks after leaving the den, therefore they remain in the den site area for several weeks after emergence from dens (Haroldson et al. 2002; Mace and Waller 1997). Researchers involved in the Delphi assessment of snowmobile impacts (Graves and Reams eds. 2001) indicated higher concerns with emergent females with cubs as they are likely the most sensitive to disturbance (Haroldson et al. 2002). Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female and safety of the cubs. If cubs attempt to follow their mother, they would likely experience decreased fitness and the family group may be pushed to less suitable habitat. A disturbance would have to be severe for a sow to abandon her cubs (Linnell et al. 2000). In the judgment of the Service, snowmobile-related impacts on post-den emergence females with cubs are more likely to impart serious consequences than any potential impacts to denning grizzly bears.

Changing snow conditions in spring may help reduce the probability grizzly bears being impacted by snowmobiles. At the time of emergence, snow conditions are changing rapidly. The same conditions that help lead to bear emergence (e.g., water infiltrating the den) (Schoen et al. 1987; Craighead and Craighead 1972) lead to poor quality snow for snowmobiling. Snow is melting at lower elevations, making access to higher elevations more difficult for snowmobilers. In general, female grizzly bears with cubs emerge later in the season, when these snow and melt conditions are even more prevalent. Individual circumstances of access and allowable seasons are important variables.

Effects of Motorized Access in the Action Area

The entire action area occurs outside of the grizzly bear recovery zones, in areas where grizzly bears have only recently been verified. Three verified occurrences of grizzly bears have occurred within or near the action area since 2010.

Table 1 above displays the existing miles of roads and linear motorized route densities on Forest lands within the action area. Based on the direction in the Forest Plan, the open linear motorized route densities would be expected to remain more or less static over time (U.S. Forest Service 2019). However, implementation of the travel management plan will result in some reduction in

miles of roads and motorized trails open to public motorized use on the Forest (*Ibid.*). Thus, the potential for displacement would likely be reduced in the future for any grizzly bears that may be attempting to move into or through the action area.

While no decisions have been made, the Forest may construct some permanent roads within the action area in the future. The Forest has estimated that 17.1 miles of permanent roads may be constructed over the life of the Forest Plan (10 years). New permanent road construction is not expected to be open to the public. Thus, open motorized route density is not expected to increase over the life of the Forest Plan.

While not specifically proposed under the Forest Plan, temporary road construction and use may occur on a project by project basis. Temporary roads built for resource extraction such as timber harvest or mining may be short-term in duration of use or may remain on the landscape for several years and receive a substantive amount of use. The Forest has estimated that approximately 54 miles of temporary roads may be constructed across the action area, over the life of the Forest Plan (10 years).

Depending on the site specific information regarding permanent and/or temporary roads (i.e. timing, length, duration), the Service anticipates that some level of adverse effects to female grizzly bears with home ranges impacted by such roads may occur in some situations in the future. We do not expect that all permanent and temporary roads would have adverse impacts on female grizzly bears, or that all female grizzly bears would be adversely affected by these roads. The level of effects would depend on such things as location of the road, length of the road, the frequency and intensity of use, and the duration the road would be on the landscape, in relation to those factors listed above for effects of roads. Not all permanent and temporary roads would likely to be constructed at once. Some of the roads would be consolidated in project areas and be constructed and used at the same time, which would concentrate effects on bears into a smaller area. Other roads would be separated by space and time across the Forest, which may affect more individual grizzly bears, but have less intense effects. New permanent roads and temporary roads will not be open to public use and temporary roads are obliterated when implementation of a project is completed, which would moderate the impacts on bears. However, if under-use of key feeding and sheltering habitat by female grizzly bears is significant, they may fail to obtain the necessary resources to breed and successfully reproduce.

Portions of the action area have high levels of motorized routes while other portions have low levels of motorized routes or no motorized routes at all. The Lower East Fork and Sleeping Child-Rye Creek analysis areas exhibit the highest open linear motorized route densities within the action area, with open linear motorized route densities of 2.5 and 2.2 miles per square mile, respectively. The remaining three analysis areas range in open linear motorized route density from 1.2 to 1.5 miles per square mile.

The effects of displacement and under-use of habitat are tempered by local resource availability, resource condition, seasonal use, and the number of grizzly bears using an area. Currently, the number of grizzly bears using the Forest is very low and numbers are expected to increase slowly over time. This is especially true for female grizzly bears. As mentioned earlier, Proctor et al. (2012) found males move more frequently and over longer distances than females. Males have large home ranges and establish home ranges nearly three times further away from their mother's home ranges than do female offspring. Females usually establish smaller home ranges than

males that overlap with their mother's home range (Waser and Jones 1983; LeFranc et al. 1987; Schwartz et al. 2003). In doing so, they generally disperse over much shorter distances than male grizzly bears (McLellan and Hovey 2001; Proctor et al. 2004). Therefore, female dispersal is a multi-generational process where females must live year-round in an area, successfully reproduce, and offspring disperse into adjacent, unoccupied habitat. Thus, female grizzly bear presence on the Forest is likely to increase slowly, only if and when population pressure from the NCDE and/or the YGBE grows. The earliest detections of grizzly bears from the NCDE found in the intervening area between the NCDE and the YBGE were male, and males make up most of the known occurrences in this region (Mace and Roberts 2012).

Adverse effects from high road densities in some areas of the action area may result in the displacement of individual grizzly bears, the avoidance of suitable habitat, and/or the reduction of habitat to an unsuitable condition. Under-use of habitat in proximity to Forest roads by grizzly bears does not necessarily preclude use or form a barrier to dispersal and movement across the landscape. Until numbers substantially increase, grizzly bears now occupying the Forest and moving into the Forest in the near future would not likely face significant competition for habitat and resources from other grizzly bears. Thus, displacement from quality habitat is not as likely to result in adverse effects to individuals, as they are likely to have options to move to other areas to find resources.

Male grizzly bears have larger home ranges than females, and males and subadults are independent, more mobile and do not have the same energetic needs as adult females. While displacement may affect behavioral patterns of males and subadults, such as feeding or sheltering, we do not anticipate such effects to be significant to subadult or male grizzly bears.

Displacement effects have more significant impacts on adult female grizzly bears than males or subadults because adult females have higher energetic needs to sustain fitness prior to and during gestation and lactation and when rearing. As such, adult females can less afford the additional energy expended to find high quality foods and shelter if displaced, especially during the early spring or late summer to fall hyperphagia season. During some years, due to poor climatic conditions and resulting food scarcity and/or high levels of forest management activity or recreational activity, displacement effects from areas with high road densities could be more frequent and intense.

Based on the lack of verified female grizzly bear or potentially very low number of female grizzly bears using the action area, and considering the low levels of intra-specific competition, we do not expect that adult female grizzly bears would be affected to levels of injury (through displacement) by high route densities at this time. However, the effects of displacement may increase somewhat as grizzly bear numbers increase over the life of the Forest Plan. Existing road densities in some areas and continued presence of these roads under the Forest Plan may at some time over the next 10 years result in adverse effects to some individual female grizzly bears attempting to establish or maintain home ranges in roaded areas. Some adult females may be displaced from key habitats and under certain conditions they may be displaced to levels that impair their normal ability to readily find food resources needed to sustain fitness necessary for breeding and producing cubs, and find shelter.

In sum, not all actions related to access under the Forest Plan will result in adverse effects. Very few grizzly bears have been verified on the Forest and most, if not all, have likely been males.

We only expect adverse effects to grizzly bears related to access management if, and when, female grizzly bears begin using the action area. We anticipate that the adverse effects from motorized route densities would affect only few adult females over the life of the Forest Plan because few grizzly bears occupy the action area at this time, and as explained earlier, female grizzly bear numbers would grow only slowly over time. Further, we do not expect that all adult females exposed to disturbances related to motorized route densities would suffer significant effects, nor would the effects persist throughout an individual female's life span. We expect that effects would vary substantially depending upon the wariness of the individual bear, the size of and habitat quality within her home range, the number of other grizzly bears using the particular area, climate conditions, annual food resources, and the nature, intensity and duration of human activity during any particular year. All of these are factors that may affect options available to adult females if displaced. Further, conditions the following year may be considerably different.

Overall, existing motorized routes and any new routes constructed in the future within action area, temporary or permanent, may affect grizzly bears. These affects may be insignificant in some situations or adverse in others. Adverse effects may significantly impact an adult female grizzly bears' ability to find food resources, breed and raise young, and find adequate shelter at some time over the life of the Forest Plan.

The primary concerns with motorized winter recreation with respect to grizzly bears are the potential effects associated with denning, den emergence, and spring habitat. Summer and fall habitats are not at issue since snowmobiling would not overlap with these seasons. Winter recreation primarily occurs during the grizzly bear denning season. However, under the Forest Plan, late season snowmobile use is not specifically limited.

Disturbance from snowmobiles is likely most consequential shortly before or after den emergence, particularly to females with cubs. Females with cubs have high energetic needs in the spring, and cubs have limited ability to travel for several weeks after emergence from the den. Disturbance levels that cause a female to prematurely leave the den in spring or move from the den area could impair the fitness of the female and safety of the cubs. If cubs attempt to follow their mother, they would likely experience decreased fitness and the family group may be pushed to less suitable habitat. Thus, significant disturbance during this time may reach levels that would injure grizzly bears, specifically adult females with cubs.

Some large, higher elevation areas that contain potential denning habitat does occur within the action area, in the Sapphire Mountains. These areas are located in the Sapphire wilderness study area and the Stony Mountain inventoried roadless area where snowmobiling is prohibited. At this time, denning of grizzly bears has not been documented in the action area and the likelihood of grizzly bears denning in the action area anytime soon is low. Furthermore, in the near future, it is probable that any grizzly bear that move into or through the Sapphire Mountains will be males. The likelihood that an adult female bear will den and have cubs in the action area is low. As such, effects to denning grizzly bears within the action area would likely be discountable and/or insignificant.

Food and Attractant Storage and Site Development

This section focuses on analysis and discussion of the direct and indirect effects to grizzly bears related to food and attractant storage issues and site development. Also refer to the '*Habituation*

to Human Attractants' subsection in the '*General Effects of Roads on Grizzly Bears'* section for further discussion on habituation.

General Effects of Food and Attractant Storage and Habituation

Improperly stored food, garbage, and/or livestock or pet foods can lure grizzly bears to areas near people and pose a significant risk of habituating bears to human presence and/or conditioning grizzly bears to seek out anthropogenic foods and attractants. Food conditioned grizzly bears enter unsecured garbage receptacles, sheds, and other buildings in search of a reward. Accessibility to human related attractants and conditioning to those rewards can lead to management removal of grizzly bears and additionally, mortality of grizzly bears by people defending their life and property.

Incidence of property damage or conflicts associated with human related foods is inversely proportional to the availability of high quality grizzly bear foods found in the wild; during periods of poor natural food production incidences of human-grizzly bear conflicts typically increase. When poor seasonal bear foods exist in part of or through the entire nondenning season in the GYE and NCDE, the incidences of bears causing property damage and obtaining anthropogenic foods increased significantly over average or good years (Gunther et al. 2004, Manley 2005). The conflict relationship is magnified when the availability of late season natural foods such as whitebark pine seeds is insufficient to meet the high energy requirements during hyperphagia (Mattson et al. 1992).

Numerous studies in the NCDE elucidate the importance of late-season frugivory, especially globe huckleberries (*Vaccinium globulare*), by grizzly bears (Martinka and Kendall 1986, Weaver et al. 1990). Berry failure due to drought or destruction of plants by fire would force grizzly bears to range more widely than in normal periods of seasonal availability (Blanchard and Knight 1991). Therefore, grizzly bears face an increased risk of encounters with humans and ultimately human-caused mortality during the autumn season. Grizzly bears in some areas that avoided trails with human activity during part of the year changed this avoidance behavior when a favored berry resource came into season (Donelon 2004). Although grizzly bears still had a low tolerance for trails with high human activity, the tendency to approach areas of human activity when nutritional and energy needs are high could put individual bears at an increased risk of immediate conflict or condition them to the presence of people, which could lead to conflicts later in time.

Effects of Food and Attractant Storage and Habituation in the Action Area

The Forest has 19 developed sites in the action area that provide for recreational and/or administrative overnight stays. Developed sites include campgrounds, rental cabins, fire lookouts, summer homes, and visitor centers. Developed sites can pose risks of unsecured attractants and food left by campers, hunters, and people using the sites. Habituated grizzly bears learn to seek out developed sites for food rewards. Habituation and food conditioning of grizzly bears is a concern in all grizzly bear populations. Throughout the distribution of grizzly bears, habituation/food conditioning remains a fairly serious risk to individual grizzly bears.

Attractant management is currently not required within the action area with the exception of the Anaconda-Pintler wilderness area. Although not required elsewhere, the Forest can and

sometimes does incorporate food storage requirements into proposed project alternatives. Food storage orders substantially reduce the potential for adverse effects to bears as a result of food conditioning and habituation at developed sites as well as dispersed human use. Without a food storage order within the action area (with the exception of the Anaconda-Pintler wilderness), there is potential for conflicts to occur between humans and any grizzly bears moving into or through the action area, possibly resulting in adverse effects to some individual grizzly bears. No grizzly bear-human conflicts have been reported to date within the action area. However, the potential for conflict between grizzly bears and humans is likely to increase, albeit slowly, as the density of grizzly bears increases within the action area.

In summary, no grizzly bear mortalities associated with improper food storage or site conflicts have been reported within the action area. However, improper storage of attractants and foods can present a risk of food conditioning grizzly bears. Thus, throughout the distribution of grizzly bears, habituation/food conditioning remains a risk to individual grizzly bears. Therefore, it is reasonable to expect that some risk of adverse impacts, though low (based on grizzly bear numbers, bear numbers are likely to increase slowly over time, and history of no attractant related conflicts in the area), to some grizzly bears related to attractant management exists over the life of the Forest Plan.

Livestock Grazing

General Effects of Livestock Grazing

Effects of livestock grazing on grizzly bears are generally related to depredations of livestock by grizzly bears, disposal of livestock carcasses, storage of human food and stock feed, and grizzly bear habituation, food conditioning, and mortality risk associated with these activities. Depredating bears may become food conditioned resulting in management actions that remove bears from the population. Although grizzly bear conflicts with cattle do exist, the more significant problems have been with sheep (Orme and Williams 1986). The adverse effects of domestic sheep grazing on grizzly bears are well documented (Knight and Judd 1983, Johnson and Griffel 1982). Sheep grazing in occupied grizzly bear habitat poses substantive risks to grizzly bears since bears kill sheep much more readily than other livestock and because sheep are often closely tended by herders typically armed and protective of their flock. In one study in the YGBE, of 24 grizzly bears known to use livestock allotments, 10 were known to kill livestock (Knight and Judd 1983). Of these bears, 7 killed sheep, 5 of which were trapped and fitted with radio transmitters. All but one radio collared grizzly bear cub that had the opportunity to kill sheep did so. Grizzly bears that kill livestock include a range of ages and both sexes (Johnson and Griffel 1982).

Being an opportunistic feeder, any individual grizzly bear can learn to exploit livestock as an available food source just as easily as they habituate to other human food sources (Johnson and Griffel 1982). Knight and Judd (1983) reported several differences between cattle and sheep conflicts with grizzly bears. They found that all radio-collared grizzly bears known to have come in close contact with sheep killed sheep, but most grizzly bears that encountered cattle did not make kills. They also found that all known cattle kills were carried out by adult bears 7 years or older, while both adults and subadults from 1 to 13 years old killed sheep. Grizzly bears that killed sheep, usually took multiple sheep over several days. However in each instance when the sheep were moved out of the area the predation ended (Johnson and Griffel 1982).

Livestock carcasses may also attract grizzly bears. Grizzly bears have a strong tendency to return to a carcass for two or more feedings (Johnson and Griffel 1982). Therefore, proper treatment or disposal of livestock carcasses would greatly reduce the potential attractants for grizzly bears.

Effects of Livestock Grazing in the Action Area

The Forest has 16 cattle allotments and no domestic sheep allotments within the action area. The amount of cattle grazing on these allotments have been decreasing over time. The biological assessment (U.S. Forest Service 2019) describes a decrease in animal unit months (AUMs) from 13,000 AUMs in 1986 to 1,634 AUMS on 8 allotments in 2014 and 803 AUMs on 6 allotments in 2018. Based on this information, the AUMSs are not expected to increase. However, the amount of grazing is not limited to these levels and could increase in the future during the life of the Forest Plan.

No grizzly bear conflicts related to grazing or depredations on livestock have been documented in the action area. Based on the information for livestock grazing in the action area (no sheep allotments, very low amount of grizzly bear use, and the history of no livestock depredations), the likelihood of adverse impacts to grizzly bears related to livestock grazing in the action area during the life of the Forest Plan is low. If the number of grizzly bears using the action area increases, the risk of conflicts with or depredations on livestock may also increase over time. For now and over the life of the Forest Plan (10 years), however, adverse effects related to grazing are unlikely.

Vegetation Management

General Effects of Vegetation Management

Vegetation management may impact grizzly bears as a result of the short-term disturbance. Longer-term effects related to vegetation management include impacts to grizzly bear cover and forage. A decrease in the amount of cover may result in different effects to grizzly bears and their habitat. If cover is limiting in the project area, either by the amount or distribution, vegetation management may result in negative impacts (Ruediger and Mealy 1978). Reduced cover may increase the visibility of grizzly bears, which may potentially increase their vulnerability to illegal human-caused mortality and/or contribute to displacement from preferred habitats. However, if cover is not limited in a project area, timber harvesting may have either no effect or a positive effect in those situations where food abundance or distribution is improved. By removing or reducing overstory vegetation through harvesting, slashing and/or burning, sunlight reaches the forest floor or clearing and grizzly bear food production may be increased (Ruediger and Mealey 1978). This includes foods such as berries and succulent forbs.

In a study on use of harvested stands, Waller (1992) found that use of these stands increased during the berry season, due to some harvested stands having high berry production. If food production or distribution is improved but human activity is not controlled after the completion of harvest activities, negative impacts on grizzly bears may occur due to an increase in the potential for conflicts between humans and grizzly bears (Ruediger and Mealey 1978). Waller (1992) found that of the harvested stands that he studied, those with the highest grizzly bear use had limited access for people due to closed gates and/or over-grown roads. Grizzly bears within

his study area that used harvested stands were found at higher elevations and spent little time in lower elevation stands where harvest was most common. Waller attributed this to human use of those lower, more accessible harvested stands. Waller also found that grizzly bears avoided stands where the vegetation had not recovered enough to provide security cover and preferred to use stands that were 30 to 40 years post-harvest.

Zager (1980) found that differences of shrub responses depended on the type of treatment that occurred post-harvest. Among the key shrub grizzly bear foods on clearcut sites where slash was bulldozer-piled before burning, Zager found a consistent decline in canopy coverage when compared to old burns. This is likely due to the extreme heat created by burning slash piles which may kill rhizomes and root crowns and bulldozer use which may also destroy rhizomes and root crowns. In those areas where slash was either broadcast burned or not treated, key grizzly bear shrub foods were generally found throughout the sites, except on skid roads and other severely disturbed areas. On relatively mesic sites, globe huckleberry, mountain-ash and serviceberry generally increased in cover.

Vegetation management activities that would occur during the grizzly bear denning season are not likely to impact grizzly bears. Snow is an excellent sound barrier (Blix and Lentfer 1992) and impacts to denning bears would likely be less in deep snow situations than in shallow snow conditions. It is likely that hibernating bears exposed to meaningless noise, with no negative consequences to the bear, habituate to this type of disturbance (Knight and Gutzweiler 1995).

Often, temporary roads are constructed and/or restricted roads are used in order to access harvest units. The impacts of roads are discussed above in the '*General Effects of Roads on Grizzly Bears*' and the '*Effects of Motorized Access in the Action Area*' sections above.

Helicopters may also be used in vegetation management projects, and in general reduce impacts to grizzly bears where they reduce or eliminate the need for new roads. Helicopter use may elicit a response in grizzly bears. Effects may range from a simple awareness of the helicopter, short-term disturbance or flight response, or displacement from an area. In timbered habitats, McLellan and Shackleton (1989) found that an overt avoidance or displacement response required high intensity helicopter activity, such as carrying equipment within 200 meters of a grizzly bear. Helicopter use that is short in duration and low in frequency, would not likely result in significant affects to grizzly bears. Extended helicopter use with multiple passes could interfere with the normal behavior patterns of grizzly bears. However, when considering long-term habitat effects, helicopter use does not use or require roads and may not pose the same chronic displacement effects or mortality risks that roads-based operations do. Helicopter use is a temporary event, whereas roads are typically chronic features on the landscape that facilitate access for people into bear habitat long after a project is complete. Consequently, while short-term helicopter activities may impact grizzly bears, they do not impart the same chronic habitat effects as roads. If repeated, low altitude flights continue into multiple seasons, the effects upon grizzly bear behavior (i.e., avoidance and more than just temporary displacement) may become more substantial.

The effects to grizzly bears of repeated, low altitude flight paths that follow open roads may be partially offset by the existing under-use of habitat in the immediate vicinity of the roads due to the "avoidance" by grizzly bears of habitat in close proximity to open roads. In many cases, the effects of helicopter logging that occurs in roaded habitat would have insignificant effects to

grizzly bears. However, helicopter logging in areas that are not highly roaded could result in adverse effects to grizzly bears adapted to the use of more secure habitat. Thus, the effects of helicopter use on grizzly bears can vary significantly; effects will be determined through an analysis of site-specific activities and conditions in the area.

Effects of Vegetation Management in the Action Area

The Forest Plan identified 216,672 acres as suitable for timber production within the action area. This is approximately 47 percent of the action area. Site specific project analysis will determine the type and extent of harvest and potential effects to grizzly bears. Every proposed vegetation management project within the action area would consider potential effects to grizzly bears during the site specific project analysis process. Based on our history of consultation on vegetation management projects, information in our files, and the analysis under the '*General Effects of Vegetation Management*' section above, we do not anticipate that vegetation management activities by themselves would result in effects to grizzly bears that would be so significant as to impact breeding, feeding or sheltering.

Activities that occur along with vegetation management activities such as temporary road construction, restricted road use, or helicopter use may result in additional effects to grizzly bears. Such effects could range from insignificant to significant depending on site-specific information. The effects of temporary roads are discussed in the '*General Effects of Roads on Grizzly Bears*' and the '*Effects of Motorized Access in the Action Area*' sections above. General effects of helicopter use are discussed above in the '*General Effects of Vegetation Management*' section. Potential effects that may occur as a result of temporary road use and/or helicopter use associated with vegetation management would be considered in a site-specific analysis. Although we anticipate more grizzly bears will inhabit the action area in the future, the number of bears is likely to be small relative to the size of the action area and numbers would increase slowly. Grizzly bears that may be affected by helicopter use or temporary roads over the life of the plan are likely to have options to move out of the area, given the low level of intra-specific competition for habitat.

In summary, with the exception of related access management or helicopter use, we do not anticipate adverse effects as a result of vegetation management within the action area. Related motorized access and helicopter use may or may not result in adverse effects to grizzly bears and any effects would be considered in a site-specific analysis.

Fire Management

General Effects of Fire Management

Fire management may result in disturbance and displacement impacts to grizzly bears. Fire suppression activities involve the presence of humans and often include the use of motorized equipment. We expect that grizzly bears would likely leave an area on their own accord in advance of an approaching fire and therefore be out of the area associated with fire suppression activities. However, if suppression activities were to take place prior to an approaching fire, grizzly bears may still be in the vicinity. Some effects from disturbance may be caused by the overall increase in human activity in a particular area. These activities may include increased vehicular traffic, aerial support and fire camps, any of which may affect a grizzly bear prior to

their leaving the area. The possibility of a direct encounter with a grizzly bear by a person or group of people involved in fire management activities is remote.

Indirect effects from fire suppression activities may result from opening previously closed roads, constructing new roads or temporary roads, constructing firebreaks, and/or constructing machine lines. These actions may temporarily contribute to the open and total road densities or may result in effects to grizzly bears similar to effect of roads on grizzly bears. Research has confirmed the adverse impacts of roads on grizzly bears (see the '*General Effects of Roads on Grizzly Bears'* section above). In addition, food and garbage storage at activity sites and camps may attract grizzly bears and contribute to risks. Such effects are also discussed above (see the '*Effects of Food and Attractant Storage and Habituation*' section above).

Wildland fires for resource benefit are typically allowed to burn where there is some degree of certainty that the fire would go out naturally or could be contained within predefined lines. These types of fires, when allowed to burn, can result in short-term negative effects and/or long-term beneficial effects depending on the vegetation species and fire severity. Some foraging habitat and/or cover may be affected in the short-term. However, natural fire often stimulates the understory and/or increases the vegetative diversity (forbs, grasses, berry-producing shrubs) in high quality grizzly bear habitat, benefitting grizzly bears in the long-term.

Fuels treatments could include prescribed fire, mechanical treatment, and/or chemical treatment. Refer to the '*General Effects of Vegetation Management'* section above for potential effects to grizzly bears.

Effects of Fire Management in the Action Area

Suppression efforts and use of prescribed burning would continue under the Forest Plan. The acres available for these activities and locations vary across the action area. The effects on grizzly bears associated with fire suppression and/or wildland fire for resource benefit would be analyzed in emergency consultation after the suppression activities are complete. A site-specific analysis of effects on grizzly bears and grizzly bear habitat as a result of fuel treatments, including prescribed burning, would occur prior to implementation of a project. Refer to the '*Effects of Vegetation Management in the Action Area*' section above for potential effects to grizzly bears. As mentioned above, such treatments by themselves would not likely result in adverse impacts to grizzly bears.

In summary, with the exception of related access management or helicopter use, we do not anticipate adverse effects as a result of fire management in the action area. Related access management and helicopter use may or may not result in adverse effects to grizzly bears and any effects would be considered in a site-specific analysis.

Energy and Mineral Development

Effects of Energy and Mineral development in the Action Area

At this time no gas or oil developments occur within the action area. Numerous mining claims for dozens of different materials do occur within the action area, however many have been abandoned. While three active mining claims currently occur within the action area, no active mining operations occur at this time. Minor activities such as surveying and collecting samples are allowed at any time, but no activities such as construction of roads, building cabins, or caching of food or equipment are authorized. The Forest also receives numerous requests for riprap material, sand, gravel, and decorative/landscaping stone. Pit or collecting areas open to the public do occur within the action area as well as gravel pits and roadside borrow areas used to provide rock for administrative use.

Given the small footprint and overall low level of mineral and energy development activity in the action area and the very low grizzly bear use of the action area, any grizzly bears that occur in the vicinity of activity related to mineral and energy development activities would likely have options to move to more undisturbed, available habitat. If grizzly bears are using the area in the vicinity of a proposed activity related to mineral development, we would expect some level of short-term disturbance from areas of activity. The effects of such are not likely to be adverse to grizzly bears.

Effects Summary

In reviewing the effects of the Forest Plan on grizzly bears in the action area, Forest management that may have the potential to adversely impact grizzly bears include motorized access and food and attractant storage. We do not anticipate adverse effects as a result of snowmobile use, livestock grazing, vegetation management, fire management, or energy and mineral development, except for the effects that may be associated with access management and food and attractant storage. Effects related to access management and food and attractant storage will vary depending on site-specific information. Not all actions related to access and attractants proposed under the Forest Plan will result in adverse effects. Very few grizzly bears have been verified on the Forest and most, if not all, have been males. We only expect adverse effects to grizzly bears related to access management if, and when, female grizzly bears begin using the action area.

If female grizzly bears begin to use the action area, specific areas with higher motorized route densities may lead to the under-use of suitable habitat by grizzly bears and may significantly impact some grizzly bears' ability to find food resources, breed and raise young, and find shelter. However, grizzly bears moving into the action area may be able to tolerate the existing levels of motorized route densities. Thus, not all female grizzly bears that may use the action area during the life of the Forest Plan will experience significant effects related to access management.

Human access into grizzly bear habitat can lead to the habituation of grizzly bears to humans. Habituation to human foods and attractants in turn increases the potential for conflicts between people and grizzly bears. Habituated grizzly bears often obtain human food or garbage and become involved in nuisance bear incidences, and/or threaten human life or property. These grizzly bears are considered food conditioned and generally experience high mortality rates as they are eventually destroyed or removed from the population through management actions.

Currently, no food and attractant storage order is in place within the action area with the exception of the Anaconda-Pintler wilderness area. No grizzly bear mortalities have been

reported within the action area related to improper food storage. However, proper food and attractant storage is learned behavior and requires public cooperation. As grizzly bears increase in numbers and expand across the action area, we cannot rule out the potential risk that grizzly bears may become habituated and food conditioned and be subject to potential management removal at some time during the life of the Forest Plan. Therefore, it is reasonable to expect that some risk, albeit low (based on grizzly bear numbers and history of conflicts in the area), of adverse impacts to grizzly bears related to attractant management exists over the life of the Forest Plan.

Although the Forest's management of grizzly bear habitat may result in direct and indirect adverse effects on individual grizzly bears, we do not anticipate that these effects will have appreciable negative impacts on the grizzly bear populations. Grizzly bears have been expanding their range into areas with higher than optimal (for grizzly bears) human use levels and mortalities and conflicts on the Forest are rare to non-existent. The action area is located well outside of the grizzly bear recovery zones. The Recovery Plan stated that grizzly bears living within the recovery zone are crucial to recovery goals and hence to delisting. Grizzly bears inside and outside of recovery zones are listed as threatened under the Act, but only lands inside the recovery zones are managed primarily for the recovery and survival of the grizzly bear as a species. In developing the recovery zones, all areas necessary for the conservation of the grizzly bear were included.

The Forest has managed and will continue to manage the lands in such a way that has allowed grizzly bears to expand into the action area. Thus, although individual grizzly bears may be adversely affected at times over the life of the Forest Plan, we anticipate that grizzly bears use will continue to increase within the Forest into the future.

VI. CUMULATIVE EFFECTS

The implementing regulations for section 7 define cumulative effects as those effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Within the action area, the Department of Natural Resources and Conservation (DNRC) manages the Sula State Forest as well as numerous small parcels scattered throughout the Bitterroot Valley. State lands within the action area were mostly burned during the fires of 2000 and were salvage logged shortly thereafter. In 2018, a record of decision on the issuance of a permit authorizing incidental take of endangered and threatened species on forested trust lands in western Montana was issued to DNRC. The permit included measures for grizzly bears that will limit the size of forest openings that can be created through timber harvesting, as well as measures for secure cover. No additional timber harvest and associated road building activities are anticipated to occur on DNRC lands within the action area in the next 5 to 10 years.

Montana Department of Fish, Wildlife and Parks (FWP) manages two Wildlife Management Areas (WMA) within the action area (Threemile and Calf Creek). The primary management goal of both WMAs is to provide winter range for elk and compatible recreational opportunities for the public. FWP has also completed a grizzly bear management plan for western Montana

and southwestern Montana. These plans establish goals and strategies to manage and enhance grizzly bear populations and to minimize the potential for grizzly bear-human conflicts. A long-term goal is to allow the populations in western and southwestern Montana to reconnect through the intervening, currently unoccupied habitats. FWP is also very active in providing public information and education about conserving grizzly bears and their habitat. This includes bear management specialists, including one in Missoula near the action area, who provide information and assistance to landowners on appropriate ways to secure food and bear attractants and respond to reports of conflicts with bears. These specialist positions have a proven track record of resulting in a reduction of human-caused grizzly bear mortalities.

Private lands occur within and adjacent to the Forest. The human population within the action area has been growing over the past few decades and growth is expected to continue. Such growth is expected to result in an increase of residential development of private lands within the action area and can result in habitat loss, habitat fragmentation, and increases in human-grizzly bear conflicts. Recreation, livestock grazing, ranching and farming, and food and attractant storage issues on private land can create grizzly bear-human conflicts by providing attractants to grizzly bears. Once grizzly bears become habituated and a nuisance, they are typically removed. Human population growth could also result in additional grizzly bear attractants and further increase the potential for grizzly bear-human conflicts. As more people use private land and adjoining federal land for homes, recreation or business, the challenge to accommodate those uses in ways that continue to protect the grizzly bear population increases.

Recreation, livestock grazing, and attractant issues on private land will likely continue to create grizzly bear-human conflicts. However, large federal land ownership and large blocks of wilderness within which human access is restricted by regulation and topography serve to reduce the impacts of larger residential human populations on grizzly bears. While federal land management cannot entirely compensate for such impacts on private land, management under the Forest Plan would continue to provide habitat for grizzly bears on Forest Service lands.

VII. CONCLUSION

After reviewing the current status of grizzly bears, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is our biological opinion that the effects of the continued implementation of the Forest Plan is not likely to jeopardize the continued existence of the grizzly bear. No critical habitat has been designated for this species therefore none will be affected. Implementing regulations for section 7 (50 CFR 402) define "jeopardize the continued existence of" as to "engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species." Our conclusion that the Forest Plan is not likely to jeopardize the continued existence of grizzly bears is based on the information presented in the 2019 biological assessment (U.S. Forest Service 2019), correspondence during this consultation process, information in our files, and informal discussions between the Service, the Forest, and other personnel.

Forest Plan direction may occasionally result in adverse effects to individual grizzly bears over the life of the plan, particularly as a result of access management direction and inadequate food and attractant storage. Based on the best available scientific information reviewed in this

consultation, adverse effects on grizzly bears as a result of the Forest Plan will not negatively impact the recovery of grizzly bears. Further, we expect the Forest Plan direction will result in conditions that support grizzly bear use of the Forest for dispersal or exploratory movements, and potentially some home range establishment at some point in the future, albeit at densities lower than those in the recovery zones. Such use of the Forest by grizzly bears may, over time, benefit grizzly bears. It is our opinion that the proposed action would not appreciably reduce the likelihood of both the survival and recovery of the grizzly bears. Below we summarize key factors related to the effects of the Forest Plan on grizzly bears as detailed and analyzed in this biological opinion. Key points of our rationale for this non-jeopardy conclusion include, but are not limited to, the following factors:

- In 1993, the Recovery Plan articulated the conservation needs for the recovery of grizzly bears. The Recovery Plan stated that recovery zones include areas large enough and of sufficient habitat quality to support recovered grizzly bear populations, and that although grizzly bears are expected to reside in areas outside the recovery zones, only habitat within the recovery zone is needed for management primarily for grizzly bears. The action area lies outside of the recovery zones.

- The recovery plan strategy has been successful and has resulted in growth of the grizzly bear populations. Grizzly bears in the YGBE, NCDE, and CYE populations have expanded into areas outside of the recovery zones. Based on the best available information, the Service concludes that the status of the both the YGBE and NCDE grizzly bear populations are robust and have reached or are nearing recovery. The population trend for the CYE has changed from declining to slightly increasing.

- The best information indicates that grizzly bear densities are currently low on the Forest. Grizzly bears have low reproductive rates, long generational times (about 10 years), and are slow to disperse across landscapes and so sufficient habitat is likely to be available to individual bears as intra-specific competition for resources would be low.

- Motorized routes in some portions of the action area may result in displacement of some female grizzly bears, if and when they occur in the action area, from key habitat at some time over the life of the Forest Plan. However, some grizzly bears are able to persist in areas with higher levels of human pressure, as documented by verified reports of grizzly bears, including females with cubs (indicating home range use), outside of the recovery zones. Based on the Forest Plan and decisions that have occurred to date and are anticipated to occur, the overall levels of open motorized routes within the action area will likely be reduced over the life of the Forest Plan. Most new road construction would be temporary. Any new permanent road construction is not expected to be open to the public.

- At this time, denning of grizzly bears has not been documented in the action area and the likelihood of grizzly bears denning in the action area anytime soon is low. Furthermore, in the near future, it is probable that any grizzly bear that moves into or through the Sapphire Mountains (the area where denning habitat is available within the action area) will be males. The likelihood that an adult female bear will den and have cubs in the action area is low. As such, effects to denning grizzly bears within the action area would likely be discountable and/or insignificant.

- Lack of a food storage order in the action area may result in grizzly bear-human conflicts and grizzly bear mortalities at some point in the future. No reported grizzly bear conflicts or mortalities related to improper food or attractant storage have occurred to date within this area.

- Based on the number of grizzly bears that occur now and are likely to inhabit the Forest over the life of the Forest Plan, we do not anticipate high levels of conflict and/or grizzly bear mortality within the action area over the life of the Forest Plan. However, as grizzly bears increase in numbers and expand within the action area, we cannot rule out the potential risk that grizzly bears may become habituated and food conditioned and be subject to potential management removal at some time during the life of the Forest Plan. Therefore, it is reasonable to expect that some risk exists, albeit low (based on grizzly bear numbers and history of conflicts in the area), of adverse impacts to grizzly bears related to attractant management.

- Montana Fish, Wildlife and Parks' bear specialist program is expected to continue to work with the public to reduce risks to grizzly bears on private and public lands. In cooperation with other agencies, this program has made notable strides toward an informed public and reduced the availability of attractants to grizzly bears on private and public lands.

- No grizzly bear conflicts related to grazing or depredations on livestock have been documented in the action area. Based on the information for livestock grazing in the action area (no sheep allotments, very low amount of grizzly bear use, and the history of no livestock depredations), the likelihood of adverse impacts to grizzly bears related to livestock grazing in the action area during the life of the Forest Plan is low. If the number of grizzly bears using the action area increases, the risk of conflicts with or depredations on livestock may also increase over time. For now and over the life of the Forest Plan (10 years) however, adverse effects related to grazing are unlikely.

- As previously explained, we also do not anticipate adverse effects as a result of vegetation management, fire management, or energy and mineral development, except for the potential effects that may be associated with access management and food and attractant storage discussed above.

- Even though the action area is outside of Grizzly Bear Recovery Zones, the Forest has managed and will continue to manage the lands in such a way that has allowed grizzly bears to expand into the action area. Thus, although individual grizzly bears may be adversely affected at times over the life of the Forest Plan, we anticipate that grizzly bears use will continue to increase within the Forest into the future.

Recovery zones were established to identify areas necessary for the recovery of a species and are defined as the area in each grizzly bear ecosystem within which the population and habitat criteria for recovery are measured. Recovery zones are areas adequate for managing and promoting the recovery and survival of grizzly bear populations (USFWS 1993). Areas within the recovery zones are managed to provide and conserve grizzly bear habitat. The recovery zones contain large portions of wilderness and national park lands, which are protected from the

influence of many types of human uses occurring on lands elsewhere. Multiple use lands are managed with grizzly bear recovery as a primary factor. As anticipated in the Recovery Plan, grizzly bear populations have responded to these conditions, have stabilized, and are increasing or at or near recovered levels in some recovery zones. In addition, the grizzly bears have been expanding and continue to expand their existing range outside of the recovery zones, as evidenced by the verified records of grizzly bears in or near the action area.

Grizzly bears outside the recovery zones probably experience a higher level of adverse impacts due to land management actions than do grizzly bears inside. Currently, the number of grizzly bears on the Forest is very low. As anticipated in the recovery plan, we expect more grizzly bears will inhabit the Forest in the future, albeit slowly. We expect grizzly bears will occur on the Forest at much lower densities than within the recovery zones. While the Forest Plan direction may have adverse effects on some of the individual grizzly bears that may use the action area now and into the future, considering the large size of the recovery zones, favorable land management within the recovery zones, and the robust status of the NCDE and YGBE grizzly bear populations, adverse effects on grizzly bears as a result of continued implementation of the Forest Plan would not have negative effects on the status of grizzly bears. Therefore, we conclude that the Forest Plan is not likely to reduce the numbers, distribution, or reproduction of grizzly bears. Because the Forest Plan would not reduce the reproduction, numbers, or distribution of grizzly bears, and is located outside of the grizzly bear recovery zones, we conclude that the Forest Plan is not reasonably expected to reduce appreciably the likelihood of both the survival and recovery of grizzly bears.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act, and Federal regulations pursuant to section 4(d) of the Act, prohibit the take of endangered and threatened species, respectively without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission that creates the likelihood of injury to listed wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement. This incidental take statement applies to the effects of access management and sanitation/food storage under the implementation of the Forest Plan.

The measures described below are non-discretionary and must be undertaken by the Forest so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest has a continuing duty to regulate the activity that is covered by this incidental take statement. If the Forest (1) fails to assume and implement the terms and conditions or (2) fails to require an applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant

document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 C.F.R. § 402.14(i)(3)].

Amount or Extent of Take Anticipated

Access management

Based on research detailed earlier in this biological opinion, the Service has defined harm of grizzly bears in terms of adverse habitat conditions caused by high motorized route densities, which displace individuals from key habitat to the extent that significant under-use of habitat by grizzly bears may occur. Using the best information on the effects of roads and road densities on grizzly bears, we conclude high open motorized route densities in portions of the action area are likely to result in a level of adverse effects to some female grizzly bears at some point in the future, primarily those that attempt to establish and maintain home ranges in the action area during the life of the Forest Plan. Future road construction, permanent or temporary, may add to or increase the likelihood of such adverse effects. These adverse effects would result from displacement of grizzly bears from essential habitat. Displacement may result in significant under-use of key habitat when high linear road densities exist on the landscape. The Service maintains that such under-use of otherwise suitable habitat within a grizzly bear's home range may constitute incidental take of grizzly bears through "harm" as a result of significant habitat alteration that impairs breeding, feeding and/or sheltering.

The Service believes that it is reasonable to assume that the level of permanent roads in the action area will not substantively increase in the next decade. However, construction of and motorized use of new permanent and/or temporary roads may be required for projects and may increase the likelihood of disturbance and displacement in or near the project area. The Forest has estimated that over the next 10 years, approximately 17.1 miles of permanent road and 54 miles of temporary roads may be constructed. New permanent roads are not expected to be open to the public. Some temporary roads may be very short in duration while other temporary roads may remain on the landscape for several years and receive a substantive amount of vehicular use.

Based on the lack of verified female grizzly bear or potentially very low number of female grizzly bears using the action area, and considering the low levels of intra-specific competition, we do not expect that high route densities would result in any take of grizzly bears (through displacement) at this time. However, the effects of displacement may increase somewhat as grizzly bear numbers increase over the life of the Forest Plan (10 years). Existing road densities in some areas and continued presence of these roads under the Forest Plan, along with new permanent and/or temporary road construction may at some point over the next 10 years result in incidental take of some individual female grizzly bears attempting to establish or maintain home ranges in roaded areas. Some adult females may be displaced from key habitats and under certain conditions they may be displaced to levels that impair their normal ability to readily find food resources needed to sustain fitness necessary for breeding and producing cubs, and find shelter.

We anticipate that in a limited number of circumstances, over the life of the Forest Plan, site specific conditions may result in significant displacement of adult females from key seasonal habitat, impairing their ability to find adequate food resources, breed and raise young, and/or find shelter. We do not anticipate any take of subadult or male grizzly bears. Male grizzly bears

have larger home ranges than females, and males and subadults are more mobile and do not have the same energetic needs as adult females. We also do not anticipate take of grizzly bears that are transient (moving through areas outside of home range use). Such individuals are highly mobile and not restricted to finding food and shelter within a home range. Thus, while displacement may affect behavioral patterns such as feeding or sheltering, we do not anticipate such effects would cause injury to transient, subadult, or male grizzly bears.

As detailed in this biological opinion, we anticipate that existing access management as well as future motorized route construction, including permanent and/or temporary roads, would affect only a very few adult females over the life of the Forest Plan because grizzly bears occur at very low densities in the action area, and females are expected to occur and possibly increase only slowly over time in the action area. Also, substantial increases in road densities are not expected. If during the life of the Forest Plan, subadult females move into the action area seeking to establish a home range, they would be exposed to levels of roading that would factor in to home range selection, and that level of roading would not likely significantly increase over the life of the plan. Therefore, the take we anticipate would be harm to only a very low number of female grizzly bears inhabiting the action area over the life of the plan. We expect harm would be caused by significant under-use of key habitat in areas affected by high road densities to levels that result in decreased fitness and impaired reproductive potential. In other words, infrequently and in site-specific circumstances, an adult female grizzly bear wary of humans and human-generated disturbance may not breed at its potential frequency or may fail to complete gestation due to decreased fitness. We do not expect all adult female grizzly bears affected by high linear road densities to suffer impairment of breeding, feeding, and/or sheltering, nor would we expect any female to experience permanent effects (lasting more than one reproductive cycle). Variables such as annual climate and resulting habitat and food resource conditions, the level of roading, and the number of grizzly bears using an area may change over time and are all factors influencing the displacement within a home range.

The effects of high road densities on individual female grizzly bears are difficult to quantify in the short term and may be measurable only as long-term effects on the species' habitat and population levels. The amount of take is difficult to quantify for the following reasons:

1) The amount of take would depend on the number of adult female grizzly bears impacted by the Forest Plan. We lack specific information on the precise number of adult female grizzly bears that will use the action area, but due to the location, number, and known-gender of verified grizzly bear occurrences in and near the action area, we reasonably assume very few adult females would be affected.
2) Individual grizzly bears would react differently to the disturbance. Not all adult female bears that are exposed to disturbances from high road densities would be adversely impacted to the point of take. Low numbers of grizzly bears would likely decrease intra-specific competition for habitat, allowing more options for individuals to move within home ranges, in many cases.
3) Some individual female grizzly bears that initially may be sensitive to disturbances may, over time, adjust to the routine disturbances generated by human activity over time.

Therefore, determining the precise amount of take, as defined by impaired reproductive potential (as affected by feeding and sheltering), is difficult. The amount of take would be also difficult to detect for the following reasons:

1) Grizzly bears are not easily detected or observed in the wild.
2) Reproductive rates of female grizzly bears vary naturally due to environmental and physiological causes.
3) A reduction in "normal" reproductive success is not discernable in the wild.
4) The reasons a grizzly bear fails to breed and/or failure to complete gestation are not discernable in the wild.

According to Service policy, as stated in the Endangered Species Consultation Handbook (March 1998) (Handbook), some detectable measure of effect should be provided, such as the relative occurrence of the species or a surrogate species in the local community, or amount of habitat used by the species, to serve as a measure for take. Take also may be expressed as a change in habitat characteristics affecting the species (Handbook, p 4-47 to 4-48). In instances where incidental take is difficult to quantify, the Service uses a surrogate measure of take. The number of grizzly bears that use the action area is unknown and female grizzly bears have yet to be verified within the action area. The mechanism of female grizzly bear dispersal makes it likely that in most of the action area, only relatively few female grizzly bears would occupy the action area during the life of the Forest Plan. Therefore, for reasons explained above, the Service anticipates that incidental take of adult female grizzly bears would be very low and occur only infrequently over the life of the Forest Plan in the form of harm related to the displacement effects of high road densities and temporary road construction and use.

We use the existing miles of open motorized routes and the open linear motorized route density within the five analysis areas of the action area, along with an additional 17.1 miles of permanent road construction and 54 miles of temporary roads construction as our **first surrogate measures of incidental take**. The linear route densities include permanent open motorized routes. Tables 2 and 3 display the first surrogate measures of incidental take for the action area, using miles of roads and trails, open linear route density on Forest lands, and miles of new construction. If permanent miles of open motorized routes and/or open linear route density increase over the amounts displayed in Table 2 or if miles of permanent and temporary road construction are higher than the amounts displayed in Table 3 over the life of the Forest Plan (10 years), then the level of incidental take we anticipated in our first surrogate measure of take would be exceeded and therefore the level of take exempted would be exceeded.

Table 2. Existing miles of open routes and open linear motorized route density on Forest Lands within the action area.

Analysis Area	Motorized Roads and Trails on Forest Land (miles)	Open Linear Route Density of Forest Routes[1]
Eightmile-Burnt Fork-Big Birch-Willow Creek	174	1.5
Skalkaho Creek	140.6	1.4
Sleeping Child-Rye Creek	290	2.2
Lower East Fork	253.3	2.5
Upper East Fork	195.6	1.2

[1] does not include routes on other land ownerships; rounded to nearest tenth.

Table 3. Miles of permanent and temporary road construction over the life of the Forest Plan (10 years).

Permanent Road Construction (miles) [1]	Temporary Road Construction (miles)
17.1	54

[1] New permanent road construction is not expected to be open to the public

Neither permanent roads nor temporary roads are expected to be open to the public. Thus, new permanent and/or temporary road construction are not expected to affect the amount of miles open to the public or the open linear motorized route densities displayed in Table 2 as they would not result in a net change to the overall open routes or open linear road densities. Further, in many cases, temporary roads have different effects on grizzly bears than those associated with permanent roads. Temporary roads are obliterated post-project and linear road densities would return to the pre-project levels, lessening the effects on grizzly bears over time.

We do not anticipate that motorized access management in all portions of the action area would result in incidental take as some areas within an analysis area may have relatively low open motorized route densities. We anticipate that the likelihood of incidental take of females would be highest in those areas with a higher amount of motorized routes. We also do not anticipate that all new permanent and/or temporary roads constructed in the action area would result in incidental take. This would depend on such things as location and length of the road and the duration it would be on the landscape, as well as the potential for female grizzly bear occurrence.

In summary, over the life of the Forest Plan (10 years) if permanent increases in open motorized routes or open linear motorized route density in any analysis area increase over conditions displayed above in Table 2, or if miles of new permanent and/or temporary road construction are higher than displayed in Table 3 above, then the level of incidental take we anticipated in our first surrogate measure of take would be exceeded and therefore the level of take exempted would be exceeded. Under CFR 402.16 (1), in any one of these scenarios, reinitiation of consultation would be required.

Food and Attractant Storage

Human access into grizzly bear habitat can lead to the habituation of grizzly bears to humans. Developed sites can pose risks of unsecured attractants and food left by campers, hunters, and people using the sites. Habituated grizzly bears learn to seek out developed sites for food rewards. Habituation to human foods and attractants in turn increases the potential for conflicts between people and grizzly bears. Habituated grizzly bears often obtain human food or garbage and become involved in nuisance bear incidences, and/or threaten human life or property. These grizzly bears are considered food conditioned and generally experience high mortality rates as they are eventually destroyed or removed from the population through management actions.

As the number of grizzly bears increase and the number of people residing in and visiting the Forest increases, the Service assumes that the potential for grizzly bear-human conflicts related to food and attractant storage will increase as well. Therefore, habituation/food conditioning of grizzly bears may occur in the action area over the life of the Forest Plan. The potential remains

for the incidental take of grizzly bears in the form of harm through uses of the Forest where grizzly bears may become habituated to people and food conditioned to anthropogenic foods. Such habituation/food conditioning results in the modification and significant impairment of natural feeding behavior. This impairment is significant in that it may ultimately result in the removal or death of grizzly bears due to necessary management removal for defense of human life or property. Thus, the potential for incidental take of grizzly bears through habituation and food conditioning will remain.

Incidental take such as habituation and/or modification of natural feeding behavior is difficult to quantify or detect. As explained earlier, in such cases the Service uses a surrogate measure of take. In this case, we anticipate that **the second surrogate measure of incidental take** resulting from the Forest Plan in the form of harm is proportional to the number of grizzly bears that are removed or killed within the action area for defense of human life or property, as a result of obtaining anthropogenic food or other attractants due to inadequate storage. We base this surrogate on the fact that both the level of take through harm and grizzly bear mortalities will be related to level of bear use in an analysis area, the level of human use, and whether a food storage order is in place or not.

The Forest Plan does not include a food and attractant storage order except in the Anaconda-Pintler wilderness area. No grizzly bear-human conflicts have been reported to date in the action area. However, without a Forest-wide order that includes the entire action area, the potential for conflicts between grizzly bears and humans remains more elevated than in areas with a food storage order.

Grizzly bears occur at very low numbers across the action area. As explained previously, we expect the number of grizzly bears to increase, but only slowly, over time during the life of the Forest Plan. As more grizzly bears begin to move through or frequent areas within the action area, we cannot rule out the possibility of conflict between grizzly bears and people as a result of inadequate food and attractant storage. Based on this information, we anticipate that **no more than one grizzly bear will be removed from the action area** during the life of the Forest Plan for management purposes related to food and attractant storage issues. This represents our surrogate measure for incidental take of grizzly bears in the form of harm through habituation and/or modification of natural feeding behavior in the action area.

Therefore, should more than one grizzly bear be killed or removed from the action area at any time during for the life of the Forest Plan because it has become habituated in relation to food and attractant storage, incidental take will be exceeded and the Forest must reinitiate consultation with the Service. Additionally, should the level of incidental take associated with food and attractant storage reach, but not exceed, the anticipated incidental take level for either area, the Forest should informally consult with the Service regarding the adequacy of existing mechanisms to minimize potential take.

Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species. The amount of incidental take described above is low. As detailed in this opinion, and according to the 1993 recovery plan (U.S. Fish and Wildlife Service 1993), the Forest Plan covers actions on lands outside of the recovery zones.

Further, considering the grizzly bear recovery strategies (U.S. Fish and Wildlife Service 1993, ICST 2007), incidental take of grizzly bears in the action area would not affect the recovery of grizzly bears. Finally, we expect that the Forest Plan direction would support at least a low number of grizzly bears that move through or live within the action area, which may benefit these grizzly bear populations over the long term. Critical habitat has not been designated for the grizzly bear; therefore none would be affected.

Reasonable and prudent measures

Biological opinions provide reasonable and prudent measures that are expected to reduce the amount of incidental take. Reasonable and prudent measures are those measures necessary and appropriate to minimize incidental take resulting from proposed actions. Reasonable and prudent measures are nondiscretionary and must be implemented by the agency in order for the exemption in section 7(o)(2) to apply. The Service has determined that the continued implementation of the Forest Plan adequately reduces the potential for and minimizes the effect of any incidental take that may result. Therefore, no reasonable and prudent measures are necessary.

Terms and conditions

As explained above, the Forest Plan will reduce the potential for or minimize the effect of incidental take. No additional reasonable and prudent measures are necessary, therefore no terms and conditions are needed with the exception of the reporting requirements.

Reporting requirements

To demonstrate that the Forest Plan is adequately reducing the potential for and minimizing the effect of any incidental take that may result, the Forest shall complete a report with the information listed below and submit it to the Service's Montana Field Office by March 1 of each year for the preceding calendar year for the life of the plan. The report shall include:

1. An up-to-date record of location and length of new permanent and temporary roads constructed and roads decommissioned on the Forest. The Forest shall also maintain an up-to-date record of linear road densities by Analysis Area.

2. An up-to-date record of grizzly bear-human conflict and/or the management removal of a grizzly bear resulting from improper storage of food or attractants. Notify the Service's Montana Field Office, within 72 hours of any grizzly bear-human conflict resulting from improper storage of food or attractants and/or the management removal or human-caused death of a grizzly bear.

Closing Statement

The Service is unable to precisely quantify the number of grizzly bears that will be incidentally taken as a result of the Forest Plan. Therefore, we use surrogate measures for the amount of incidental take we anticipate. We use the existing levels of access management as well as new permanent and temporary road construction as our surrogate measure of incidental take related to

access management. We anticipate that no more than one grizzly bear will be removed from the action area related to food and attractant storage for the life of the Forest Plan.
We determined that the Forest Plan, with its incorporated objectives, goals and standards, adequately reduces the potential for and minimizes the effect of any incidental take that may result. Therefore, reasonable and prudent measures, with their implementing terms and conditions, were not provided. However, reporting requirements were included in order to demonstrate that the Forest Plan is adequately reducing the potential for and minimizing the effect of any incidental take that may result. If, during the course of the action, the level of take occurring exceeds that anticipated in this incidental take statement, such incidental take represents new information requiring reinitiation of consultation and review of the incidental take statement. The federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Sections 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for the species.

1. Continue to manage access on the Forest to achieve lower road densities. By managing motorized access, several grizzly bear management objectives could be met including: (1) minimizing human interaction and potential grizzly bear mortality; (2) minimizing displacement from important habitats; (3) minimizing habituation to humans; and (4) providing relatively secure habitat where energetic requirements can be met (Interagency Grizzly Bear Committee 1998). Additionally, lower road densities would also benefit other wildlife and public resources.

2. Motorized access management is only one of several factors influencing grizzly bear habitat and grizzly bear security. The presence of attractants is a major factor leading to the food conditioning and habituation, and the eventual direct mortality or management removal of grizzly bears. The Service recommends that the Forest add food storage requirements to permits and contracts when planning projects. Management of garbage, food and livestock feed storage, to prevent access to bears, benefits grizzly bears as well as black bears and other carnivores. Human/carnivore interactions would also be reduced, -leading to a public safety benefit.

3. Grizzly bears concentrate in certain areas during specific time periods to take advantage of concentrated food sources or because the area provides a high seasonal food value due to diversity in vegetation and plant phenology (e.g., important spring for fall range). Where grizzly bear use is known or likely to occur and where practicable, delay disturbing activities during the spring in spring habitats to minimize displacement of grizzly bears.

REINITIATION NOTICE

This concludes consultation on the effects of the continued implementation of the Forest Plan on grizzly bears. As provided in 50 C.F.R. § 402.16, reinitiation of formal consultation is required and shall be requested by the federal agency or by the Service, where discretionary federal involvement or control over the action has been retained or is authorized by law and: (a) if the amount or extent of taking specified in the incidental take statement is exceeded; (b) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (c) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (d) if a new species is listed or critical habitat designated that may be affected by the identified action.

Thank you for your continued assistance in the conservation of endangered, threatened, and proposed species. If you have any questions or comments on this biological opinion, please contact Katrina Dixon at (406) 449-5225, ext. 222.

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